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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/396,381	09/15/1999	SHUNPEI YAMAZAKI	0756-2027	7365

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ERIC ROBINSON
PMB 955
21010 SOUTHBANK ST.
POTOMAC FALLS, VA 20165

EXAMINER

ANGEBRANNDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 12/05/2002

22

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/396,381

Applicant(s)

YAMAZAKI ET AL.

Examiner

Martin J Angebranndt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2002 and 23 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20,22-34,36-48 and 50-167 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 1-20,22-34,36-48 and 50-167 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13 & 21 6) ☐ Other: _____

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1 The response provided by the applicant has been read and given careful consideration. Responses to the arguments offered by the applicant are presented after the first rejection to which they are directed. References 2000-104170 and 2000-104170 are the appropriate way to reference the Japanese applications cited in the other document section of the IDS received on 1/18/2002 (12/21/2001 mailing date). The provisional rejection over co-pending Application No. 09/396382 (now US Patent 6,468,617) is withdrawn based upon the amendments.

2 The examiner would like to point out that it has been held in the courts that the “applicant has [an] obligation to call the most pertinent prior patent to [the] attention of [the] Patent Office in a proper fashion.” [Penn Yan Boats, Inc. V. Sea Lark Boats, Inc., et al. 175 USPQ 260 (DC SFla 1972)]. The examiner would appreciate the applicant identifying why the cited reference is pertinent including relevant portions of the document cited. The applicant has submitted 6 information disclosure statements to date. The examiner also reminds the applicant that cited prior art may be used in re-examinations.

3 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4 Claims 1-6,15-20,29-34,43-49,57,59,61-66,68,70,72-77,79,81,83-88,90,92,94-99,134,136,138-143,145,147,149-154,156,158, and 160-165 are rejected under 35 U.S.C. 103(a)

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as being unpatentable over Miyamoto JP 04-219647 or Hirayama et al. JP 04-355228, in view of Ikoma et al. '829 combined with either Shinohara et al. 63-275037 or Murai et al. '132.

Miyamoto JP 04-219647 teaches magneto-optic recording media having a protective layer of 20-100 nm in thickness.

Hirayama et al. JP 04-355228 teaches protective layers of diamond like carbon with thicknesses of 30-150 nm for the protective layer.

Ikoma et al. '829 teaches an optical recording card which includes a ultrahard carbon film having a thickness of 0.01 to 2 microns (10-200 nm) (col 3/lines 44-48, hereinafter 3/44-48). The Raman spectrum of this film has been measured to determine its structure (3/1-34). The use of a semiconductor laser having an output of 780 nm is disclosed in the examples.

Shinohara et al. 63-275037 teaches forming dense hard carbon films with decreased pinholes, thereby allowing films with reduced thicknesses to be formed. The plasma is described as a hydrocarbon plasma in the abstract and would therefore introduce at least some of the hydrogen into the carbon film.

Murai et al. '132 teach the use of an irregular discharge to form denser carbon protective films for use in magnetic recording media. The coating is harder and therefore more wear resistant. (2/24-55). Listed as carbon sources are methane, hexane, isooctane, benzene and others. These are all hydrocarbons and would introduce hydrogen into the film.

It would have been obvious to one skilled in the art to use the magneto-optic recording media of over Miyamoto JP 04-219647 or Hirayama et al. JP 04-355228 with lasers known to be useful within the magneto-optical recording art, such as semiconductor lasers having outputs in the 700-800 nm range disclosed by Ikoma et al. '829, based upon its disclosed functionality as well as to use other carbon films known within the recording medium art to have excellent hardness, are denser, and reduced defects, such as those of Shinohara et al. 63-275037 or Murai

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et al. '132 to allow thinner films to be used and thereby increase the rate of manufacture of the recording media.

The applicant argues that the Shinohara et al. 63-275037 or Murai et al. '132 do not teach the recited carbon films with the recited pinhole densities. The examiner notes that both of these references teach dense carbon films and Shinohara et al. 63-275037 in particular teaches low pin holing. **The applicant may submit data concerning films produced by Shinohara et al. 63-275037 or Murai et al. '132 to support his position that the films do not meet the recited claim requirements.** The rejection stands.

The applicant argues that increases in hardness and adhesion do not always correlate with reduced pinholes. The examiner agrees that these do not correlate exactly, but points to Shinohara et al. 63-275037 which teaches that the density of the films does correlate with reduced pin-holes. The examiners position is not merely one of correlating hardness with pin-holing, but rather increased density with reduced pin-holing and the resulting hardness of the films is desirable in protective layers as it makes them more resistant to mechanical damage.

The specification indicates that hydrocarbon gasses may be used as the source material for forming the film (23/30-34, 26/30-34, 31/6-17, 34/32-34). The specification at 36/29-33 indicates that component atoms besides carbon are incorporated into the film. The examiner adopts the position that as hydrocarbon materials are used as the source material for the carbon, and these contain hydrogen, that at least some hydrogen is also incorporated into the carbon films of the prior art during formation. The rejection stands.

5 Claims 1-6, 8-20, 22-34, 36-48, 50-100 and 134-166 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto JP 04-219647 or Hirayama et al. JP 04-355228 combined with Ikoma et al. '829 and either of Shinohara et al. 63-275037 or Murai et al. '132, further in view of Shinohara JP 01-184722 or Kitoh et al. '850.

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Shinohara JP 01-184722 teaches the incorporation of boron (as B_2H_6) silicon and/or Ti in amounts of 3-15% of the final film composition for magnetic recording media with high hardness. (page 2/lower right column). This increases C/N for short wavelengths. (abstract)

Kitoh et al. '850 teach the incorporation of tin, germanium, silicon, lead, and fluorine into hard carbon protective coatings to increase peeling resistance, crack resistance and corrosion resistance. (abstract) These are incorporated preferably in amounts of 3-10 % (2/45-51)

It would have been obvious to one skilled in the art to use the optical recording media of either Miyamoto JP 04-219647 or Hirayama et al. JP 04-355228 as modified by Ikoma et al. '829 combined with Shinohara et al. 63-275037 or Murai et al. '132 by including other materials such as Si, N, and/or fluorine as taught by Shinohara JP 01-184722 or Kitoh et al. '850 to obtain the benefits ascribed to this addition to hard carbon films by Shinohara JP 01-184722 or Kitoh et al. '850.

The examiner notes that the films of Shinohara JP 01-184722 or Kitoh et al. '850 each teach the incorporation 3-10 % of Si, B or F in to the films, therefore the arguments of the applicant are unsupported.

6 Claims 1-6, 15-20, 29-34, 43-48, 57, 59, 61-66, 68, 70, 72-77, 79, 81, 83-88, 90, 92, 94-99, 134, 136, 138-143, 145, 147, 149-154, 156, 158, and 160-165 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al. '229, in view of Ikoma et al. '829 combined with Shinohara et al. 63-275037 or Murai et al. '132.

Brezoczky et al. '229 teaches the use of 30 nm thick carbon films with magneto-optical recording media. (7/21-45). These are disclosed as being used with semiconductor lasers. (7/25)

It would have been obvious to one skilled in the art to use the magneto-optical recording medium of Brezoczky et al. '229 with lasers known to be useful within the optical recording medium art, such as semiconductor lasers having outputs in the 700-800 nm range disclosed by Ikoma et al. '829, based upon its disclosed functionality as well as to use other carbon films

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known within the recording medium art to have excellent hardness, are denser, and reduced defects, such as those of Shinohara et al. 63-275037 or Murai et al. '132 to allow thinner films to be used and thereby increase the rate of manufacture of the recording media.

The rejection is maintained for the reasons provided above as no further arguments were directed at this rejection.

7 Claims 1-6,8-20,22-34,36-48,50-100 and 134-166 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezoczky et al. '229, in view of Ikoma et al. '829 combined with Shinohara et al. 63-275037 or Murai et al. '132 and either Shinohara JP 01-184722 or Kitoh et al. '850.

In addition to the basis provided above, it would have been obvious to one skilled in the art to use the optical recording medium of Brezoczky et al. '229 as modified by Ikoma et al. '829 combined with Shinohara et al. 63-275037 or Murai et al. '132 by including other materials such as Si,N, and/or fluorine as taught by Shinohara JP 01-184722 or Kitoh et al. '850 to obtain the benefits ascribed to this addition to hard carbon films by Shinohara JP 01-184722 or Kitoh et al. '850.

The rejection is maintained for the reasons provided above as no further arguments were directed at this rejection.

8 Claims 101,103,105-107,109,110,112,114,116-118,120,121,123,125,127-129,131,132, 134,136,138-140,142,143,145,147,149-151,153,154,156,158,160-162,164 and 165 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyanagi et al. JP 02-064939, in view of Marchant "Optical recording: A technical overview", pp. 132-139 (©1990).

Aoyanagi et al. JP 02-064939 in example 1 discloses an optical disk with 500 angstrom thick carbon layer which resists a testing under 80 degrees C and 95 % relative humidity as detailed in table 1 in the lower left hand side of page 2. The examiner adopts the position that

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the film must not have pinholes otherwise the deterioration under these conditions would not be prevented. The media produced are CDs. The examples uses methane (CH_4) on page 2 in the first line of the lower left column.

Marchant "Optical recording: A technical overview", pp. 132-139 (©1990) teaches that various lasers have been used for optical recording, including the Ar ion and the He-Cd laser which have outputs in the blue region of the visible spectrum. The use of semiconductor diode lasers is disclosed as desirable due to their low power requirements, size, ease of modulation and cost. These are disclosed as having outputs of 780 nm and longer.

It would have been obvious to one skilled in the art to use the optical recording medium of Aoyanagi et al. JP 02-064939 with lasers known to be useful within the optical recording medium art, such as semiconductor lasers having outputs in the 700-800 nm range disclosed by Marchant "Optical recording: A technical overview", pp. 132-139 (©1990), based upon its disclosed functionality.

The specification indicates that hydrocarbon gasses may be used as the source material for forming the film (23/30-34, 26/30-34, 31/6-17, 34/32-34). The specification at 36/29-33 indicates that component atoms besides carbon are incorporated into the film. The examiner adopts the position that as hydrocarbon materials are used as the source material for the carbon, and these contain hydrogen, that at least some hydrogen is also incorporated into the carbon films of the prior art during formation. The rejection stands.

9 Claims 101-107, 109-118, 120-129, 131-140, 142-151, 153-162 and 164-166 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kugimiya JP 63-003077, in view of

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Marchant "Optical recording: A technical overview", pp. 132-139 (©1990) and Mitsuhiro JP 04-265516.

Kugimiya JP 63-003077 describes a diamond like carbon film, which does not suffer from pinholes. (abstract). The examples describe the tape recording media. The use of these films in disc, tape, touch panels or the like is disclosed. (abstract). These films include ppm amounts of boron or phosphorus as evidenced from the tables.

Mitsuhiro JP 04-265516 teaches carbon films as protective layers for various recording media, which include fluorine as an impurity. The sputtering in an atmosphere containing hydrogen, hydrocarbons and fluorocarbons is disclosed. The amounts of fluorocarbon is only 1-10% of the hydrogen content. (section[0014])

It would have been obvious to one skilled in the art to modify the invention of Kugimiya JP 63-003077 by using disk type media such as those disclosed by Mitsuhiro JP 04-265516 based upon the direction to disk media within Kugimiya JP 63-003077 and the disclosure by Mitsuhiro JP 04-265516 that the media disclosed therein are amenable to use with carbon protective layers and further it would have been obvious to one skilled in the art to use the resulting media with lasers known to be useful within the optical recording medium art, such as semiconductor lasers having outputs in the 700-800 nm range disclosed by Marchant "Optical recording: A technical overview", pp. 132-139 (©1990), based upon its disclosed functionality.

The examiner notes that the films of Kugimiya JP 63-003077 teach the incorporation ppm amounts of B or P and Mitsuhiro JP 04-265516 teaches the incorporation of F in amounts of approximately 10% into the films, therefore the arguments of the applicant are unsupported.

10 Claims 101,103,105-110,112,114,116-121,123,125,127-132, 134,136,138-143,145,147,

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149-154,156, 158-165 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyanagi et al. JP 02-064939, in view Ikoma et al. '829.

It would have been obvious to use the optical recording medium of Aoyanagi et al. JP 02-064939 with lasers known to be useful within the optical recording medium art, such as semiconductor lasers having outputs in the 700-800 nm range and to evaluate the quality of the film following formation using Raman scattering or the like as taught by Ikoma et al. '829 to determine the structure of the film as this is known to be desirable within the art.

The rejection is maintained for the reasons provided above as no further arguments were directed at this rejection.

11 Claims 101-166 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kugimiya JP 63-003077, in view of Ikoma et al. '829 and Mitsuhiro JP 04-265516.

It would have been obvious to one skilled in the art to modify the invention of Kugimiya JP 63-003077 by using disk type media such as those disclosed by Mitsuhiro JP 04-265516 based upon the direction to disk media within Kugimiya JP 63-003077 and the disclosure by Mitsuhiro JP 04-265516 that the media disclosed therein are amenable to use with carbon protective layers and further it would have been obvious to use the resulting media with lasers known to be useful within the optical recording medium art, such as semiconductor lasers having outputs in the 700-800 nm range and to evaluate the quality of the film following formation using Raman scattering or the like as taught by Ikoma et al. '829 to determine the structure of the film as this is known to be desirable within the art.

The rejection is maintained for the reasons provided above as no further arguments were directed at this rejection.

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12 Claims 1-6,8-20,22-34,36-48,50-167 are rejected under 35 U.S.C. 103(a) as being unpatentable over the rejection above as applied to claims 1-6,8-20,22-34-36-48 and 50-166 above, and further in view of Iio et al. JP 01-270596.

Iio et al. JP 01-270596 teaches that when ultrasonically oscillating/vibrating the deposition substrate, diamond-like carbon coatings using hydrocarbon materials, such as methane and acetone, as the carbon source material exhibit increased uniformity and reduced particle size and increased adhesivity toward the substrate.

It would have been obvious to one skilled in the art to ultrasonically vibrate/oscillate the substrate during the carbon formation processes of the rejection above with a reasonable expectation of achieving the benefits ascribed to this technique by Iio et al. JP 01-270596.

13 The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14 Claims 8-14,22-28,36-42,50-56,58,60,69,71-78,80,82-89,91,93-100,102,104-111,113,115-122,124,126-133,135,137-144,146,148-155,157 and 159-167 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of U.S. Patent 6,171,674 (including the particulars of 6,17,20,24-26,29-31,34-36,39-41,43,46,47,68,63,64,67,27,32,37,42,44,51,58,95-103,106,107,110,111,114,115,116,119,120,121,124-126,129-131 and 134). Although the conflicting claims are not identical, they are not patentably distinct from each other **because it would have been obvious to one skilled in the art to use the media in a manner congruent with their only possible use.**

The amendment to the claims recites a limitation found in the claims of the patent and therefore does not obviate the rejection of record. The rejection stands.

15 Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Angebrannndt whose telephone number is (703) 308-4397.

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I am normally available between 7:30 AM and 5:00 PM, Monday through Thursday and 7:30 AM and 4:00 PM on alternate Fridays.

If repeated attempts to reach me are unsuccessful, my supervisor may be reached at (703) 308-4552.

Facsimile correspondence should be directed to **(703) 872-9311**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.



Martin J. Angebranndt
Primary Examiner, Group 1750
December 2, 2002